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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,271	08/27/2003	Joseph Grayson Minton JR.	106102-00-01	7271
20828 7590 01/26/2007 PETER E ROSDEN 1505 LONDON ROAD CHARLOTTESVILLE, VA 229018881			EXAMINER DAY, HERNG DER	
			ART UNIT	PAPER NUMBER
			2128	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.		Applicant(s)	
	10/649,271		MINTON, JOSEPH GRAYSON	
	Examiner		Art Unit	
	Herng-der Day		2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 October 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This communication is in response to Applicant's Amendment and Response ("Amendment") to Office Action dated August 10, 2006, filed October 30, 2006.

1-1. Claims 1, 3, 4, and 14 have been amended. Claims 1-19 are pending.

1-2. Claims 1-19 have been examined and rejected.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 17 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3-1. Claim 17 recites the limitation "randomizing" at line 1 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 1-19 are rejected under 35 U.S.C. 101 because the inventions as disclosed in claims are directed to non-statutory subject matter.

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5-1. Regarding claims 1-19, it appears to be directed to the manipulation of abstract ideas of generating flow vectors without resulting in a practical application producing a concrete, useful, and tangible result.

For example, claim 1 recites “if flow vectors for minor cells within more than one major cell are desired, designating one major cell for which to begin generating flow vectors” in lines 14-15 of the claim. However, if “flow vectors for minor cells within more than one major cell are desired” is not true, no step has been recited and, therefore, no concrete, useful, and tangible result may be produced for a practical application.

For example, claim 4 recites “exiting the method” under certain conditions if no good outlet is found which does not appear any concrete, useful, and tangible result may have been produced for a practical application. Furthermore, claim 4 recites “recalculating and storing in the memory flow vectors for all minor cells in the buffered array if the depression is fixed” at the last 2-3 lines of the claim. However, if the depression is not fixed, recalculating and storing step is invalid and, therefore, no concrete, useful, and tangible result may be produced for a practical application.

For example, claim 14 recites “recalculating and storing in the memory flow vectors for all minor cells in the buffered array if the peak is fixed” at the last 2-3 lines of the claim. However, if the peak is not fixed, recalculating and storing step is invalid and, therefore, no concrete, useful, and tangible result may be produced for a practical application.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Garbrecht et al., “The Assignment of Drainage Direction over Flat Surfaces in Raster Digital Elevation Models”, Journal of Hydrology, June 1997, pages 204-213, (IDS 6 filed September 25, 2003).

7-1. Regarding claim 1, Garbrecht et al. disclose a computer-implemented method using a computer having a memory for storage of information representative of hydrologic and hydraulic conditions for determining water flow directions based on flow vectors calculated in part with a D8 method applied to [all or] part of a watershed divided into more than one predefined, rectangular major cell each encompassing at least nine predefined, rectangular minor cells including a center minor cell and eight neighbor minor cells wherein the watershed includes one [or more] type[s] of problem areas identified as [depressions,] flat areas [or peaks] each of which extends across one [or more] major cells and each of which requires fixing and wherein further the number, location and elevation of all minor cells are known as are a maximum depth depression to be corrected, a maximum number of downstream minor cells to check in fixing depressions and peaks, a largest depression area to fix and a largest flat area to fix, comprising:

[if flow vectors for minor cells within more than one major cell are desired,] designating one major cell for which to begin generating flow vectors (page 207, Fig. 1(a) as a major cell);

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creating a buffered array in the memory containing elevation and identification data for all minor cells in the designated major cell and all major cells, if any, bordering the designated major cell (page 207, Fig. 1(a), upper-right values represent cell elevation);

calculating flow vector values for each minor cell within the buffered array using the D8 method wherein a flow vector value of zero is assigned to any minor cell located in a problem area for which a flow vector value cannot be calculated using the D8 method (page 207, Fig. 1(a)-(d) shows elevation incrementation);

storing in the memory the calculated flow vector values in association with the minor cell to which they relate (page 207, Fig. 1(d) shows flow direction);

checking the flow vector value of each minor cell within the designated major cell until all cells have been checked and all cells having a flow vector value of zero have been found (page 207, Fig. 1(d) shows flow direction);

assigning a problem type in the memory to each minor cell having a flow vector value of zero (a flat surface of 25 cells, page 206, section 3, paragraph 1);

[fixing first all minor cells in the designated major cell to which a depression problem type has been assigned wherein depressions are fixed independently and successively from the highest depression to the lowest depression and elevation changes are imposed on minor cells, as required;]

fixing second all minor cells in the designated major cell to which a flat area problem type has been assigned wherein each flat area is fixed independently and elevation changes are imposed on minor cells, as required (page 207, Fig. 1(a)-(d) shows elevation incrementation);

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[fixing third all minor cells in the designated major cell to which a peak problem type has been assigned wherein peaks are fixed independently and successively from the lowest peak to the highest peak and elevation changes are imposed on minor cells, as required;]

recalculating and storing in the memory flow vector values for each minor cell within the buffered array using the D8 method wherein a flow vector value of zero is assigned to any minor cell located in a problem area for which a flow vector cannot be calculated using the D8 method (page 207, Fig. 1(a)-(d) shows elevation incrementation)

checking again the flow vector value of each minor cell within the designated major cell until all cells have been checked and all cells having a flow vector value of zero, if any, are found;

if any minor cells having a flow vector value of zero have been found,

[fixing first all minor cells in the designated major cell to which a depression problem type has been assigned wherein depressions are fixed independently and successively from the highest depression to the lowest depression by imposing elevation changes on minor cells, as required;]

fixing second all minor cells in the designated major cell to which a flat area problem type has been assigned wherein each flat area is fixed independently by imposing elevation changes on minor cells, as required (page 207, Fig. 1(a)-(d) shows elevation incrementation);

[fixing third all minor cells in the designated major cell to which a peak problem type has been assigned wherein peaks are fixed independently and successively from the lowest peak to the highest peak and elevation changes are imposed on minor cells, as required;]

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storing in the memory the elevation and flow vector data associated with each minor cell as changed, if necessary (page 207, Fig. 1(d) shows flow direction); and

[if there are unselected major cells remaining, selecting another major cell and returning to the creating a buffered array step] (applied to part of a watershed, e.g. only to one major cell).

7-2. Regarding claim 2, Garbrecht et al. disclose a new algorithm that modifies flat surface with a D-8 flow-routing approach (page 205, paragraph 4). Therefore, assign flow vector values is anticipated using D-8 approach with only one major cell. Applicant also admits in paragraph [0036] the routine for making corrections for flat areas is derived largely from the published work of Garbrecht et al.

8. Claims 4-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Martz et al., "An Outlet Breaching Algorithm for the Treatment of Closed Depressions in a Raster DEM", Computers & Geosciences, August 1999, pages 835-844, (IDS 8 filed September 25, 2003).

8-1. Regarding claims 4-13, Martz et al. disclose a computer-implemented method using a computer having a memory for storage of information representative of hydrologic and hydraulic conditions for determining water flow directions based on flow vectors calculated in part with a D8 method applied to [all or] part of a watershed divided into more than one predefined, rectangular major cell each encompassing at least nine predefined, rectangular minor cells including a center minor cell and eight neighbor minor cells, wherein the watershed includes one or more problem areas identified as depressions requiring flow vector correction of minor cells therein, each of which extends across one or more major cells, wherein the number, location and elevation of all minor cells are known as are a largest depression area to be corrected, a maximum number of times a maximum depth depression may be modified in an attempt to fix

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any individual depression and a maximum number of downstream cells permitted to be checked to find a good outlet and wherein further a buffered array containing elevation and identification data for all minor cells in a designated major cell and in all major cells, if any, bordering the designated major cell has been established in the memory and flow vector values for all minor cells in the buffered array have been calculated and stored in the memory to the extent possible based on a D8 method and any minor cell located in a depression has been assigned a zero flow vector value. All steps are anticipated by Martz et al. as shown in Fig. 2 by TOPAZ outlet breaching algorithm because the computer-implemented method is applied only to part of a watershed (e.g., only one major cell) as recited in the preamble.

Applicant's Arguments

9. Applicant argues the following:

(1) "Several inadvertent typographical errors and unintentional omissions pointed out by the Examiner have been corrected." (Page 20, paragraph 2, Amendment).

(2) various amendments to the claims have overcome the rejections based on §112 (Pages 20-21, Amendment).

(3) "This rejection has been overcome by amending independent claims 1, 4 and 14 to clarify that applicant's method is implemented on a computer having a memory storing data relating to hydraulic and hydrologic conditions. Various steps in that method result in altering the memory of that computer. Altering the memory of a computer in itself constitutes physical transformation of an object to another state and therefore constitutes patentable subject matter." (Page 21, paragraph 6, Amendment).

(4) “the Examiner stated that in Fig. 7, unfixable conditions exist for fixing depressions. Applicant’s method does not ignore such situations. Instead, it handles them by resetting the highest depression variable at 4020 and looking for the next highest depression at 4030. (Spec., pg. 14, para. 29).” (Page 22, paragraph 1, Amendment).

(5) “Claim 1 has been amended to clarify that applicant’s method is applicable to watersheds divided into more than one array. One of the limitations of previously known methods limited to a single array, such as Garbrecht et al., is that as the array size grows to reflect a larger watershed, computer memory requirements are eventually exceeded. That is why applicant’s method uses a series of major cells to subdivide a watershed.” (Page 22, paragraph 2, Amendment).

(6) “There is no storing of problem types nor sorting based on elevation as occurs in applicant’s method.” (Page 23, paragraph 2, Amendment).

(7) “Applicant’s method was designed to fix both small spurious depressions and large man-made obstructions to flow.” (Page 23, paragraph 3, Amendment).

(8) “Applicant’s method accomplishes breaching completely differently - it examines the potential outlet, and then traces a flow path downstream (using the D8 method) until it hits an elevation lower than the original depression elevation.” (Page 23, paragraph 3, Amendment).

(9) “there is no mention in TOPAZ anywhere of a maximum depth depression to fix, or a maximum size flat area to process.” (Page 24, paragraph 1, Amendment).

(10) “claim 4 has been amended to clarify that applicant’s method applies to “more than one predefined, rectangular major cell” thus further differentiating it from Martz et al.” (Page 24, paragraph 1, Amendment).

Response to Arguments

10. Applicant's arguments have been fully considered.

10-1. Applicant's argument (1) is persuasive. The objections to the specification and drawings in Office Action dated August 10, 2006, have been withdrawn.

10-2. Applicant's argument (2) is persuasive. The rejections of claims 1-19 under 35 U.S.C. 112, second paragraph, in Office Action dated August 10, 2006, have been withdrawn.

10-3. Applicant's argument (3) is not persuasive. By altering the memory of a computer in itself does not constitutes physical transformation of an article or physical object to a different state or thing in the instant claims because the memory is still a memory without any physical transformation to a different state or thing even the stored data have been altered.

10-4. Applicant's argument (4) is not persuasive. 4020 and 4030 as shown in Fig. 7 do not appear to have guaranteed all the unfixable conditions (e.g., no data) can be solved and a concrete, useful, and tangible result would be produced.

10-5. Applicant's argument (5) is not persuasive. Although Applicant argues "claim 1 has been amended to clarify that Applicant's method is *applicable* to watersheds divided into more than one array", Applicant's method may be *applied* to *part* of a watershed (e.g. only to one major cell) and include only *one* type of problem (e.g., flat areas) as recited in the preamble. Under this condition, the teachings of Garbrecht et al. anticipate all the limitations of claim 1.

10-6. Applicant's argument (6) is persuasive. The rejections of claim 3 under 35 U.S.C. 102(b) in Office Action dated August 10, 2006, have been withdrawn.

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10-7. Applicant's argument (7) is not persuasive. As recited in the preamble of claim 1, Applicant's method may be *applied to part* of a watershed. It is noted that the features upon which applicant relies (i.e., large man-made obstructions) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

10-8. Applicant's argument (8) is not persuasive. As recited in the preamble, "a maximum number of downstream cells permitted to be checked to find a good outlet" is known. However, this known maximum number has not been limited to, for example, greater than two. Accordingly, when the known maximum number has been set to one, for example, claims 4-13 are anticipated by the teachings of Martz et al.

10-9. Applicant's argument (9) is not persuasive. Although "there is no mention in TOPAZ", Applicant's reciting "a maximum depth depression to fix" or "a maximum size flat area to process", does not make the claims overcome the prior art. Applicant has not set any limitations to these "maximum" values in the disclosure. When these "maximum" values are small enough (e.g., within the range the prior art is capable to perform or within a minor cell) claims 1-2 and 4-13 are anticipated by the respectively cited prior art.

10-10. Applicant's argument (10) is not persuasive. As recited in the preamble of claim 4, Applicant's method may be *applied to part* of a watershed (e.g. only to one major cell) even the watershed may be divided into more than one predefined, rectangular major cell.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Herng-der Day whose telephone number is (571) 272-3777. The Examiner can normally be reached on 9:00 - 17:30.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: (571) 272-2100.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Kamini S. Shah can be reached on (571) 272-2279. The fax phone numbers for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

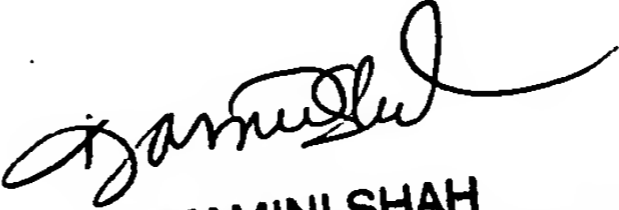
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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Herng-der Day

January 18, 2007

H.D.


KAMINI SHAH
SUPERVISORY PATENT EXAMINER